ABDOMINAL CRISES CAUSED BY MECKEL'S DIVERTICULUM.

REPORT OF TWO RECENT CASES, WITH A REVIEW OF THE LITERATURE OF THE SUBJECT.

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CASE I.—F. P., a fairly healthy child, ten years of age, on the evening of May 28, 1904, was suddenly taken with vomiting and severe pain in the right lower abdomen. Patient was seen by me in consultation with Dr. E. O. Elmer at 1 P.M., May 29. At that time the child had the appearance of commencing general peritonitis. An anxious countenance, abdominal dyspnœa. Pulse, 120; rectal temperature, 102.5° F. Abdomen presented general tympanitic distention. Right rectus very rigid. Marked tenderness over McBurney point. The bowels had been moved by calomel and enema. Heart and lungs normal, save coarse bronchial râles. Kidneys secreting freely. No bladder irritation. Diagnosis, acute appendicitis with probable perforation. Leucocyte count not made. Operation under chloroform anæsthesia at 5 P. M. One hundred cubic centimetres of sanguinopurulent serum escaped upon incising the peritoneum. A dense, round mass was felt directly under the incision. This proved to be, not the appendix, but a distended, inflamed, and *perforated* Meckel's diverticulum. A small quantity of bile-stained fæces was escaping from the perforation, which was near the attachment to the ileum. The omentum was adherent to the distal end of the diverticulum. Plaques of lymphatic exudate marked the efforts of nature in walling off the destructive process. The intestine was purse-stringed, with No. 2 chromic gut, one-half centimetre from its junction with diverticulum. The latter was clamped and severed, and the intestine turned in, as is commonly done in dealing with the stump of an appendix. The diverticulum was three to four centimetres in length and two centimetres in diameter. Its mucosa was deeply engorged and bulging into the perforation. Apparently but a small amount of fæces had escaped into the abdominal

cavity. The mesenteric glands were enlarged in either direction from the seat of the disease. The appendix, which was found deep in the right iliac fossa, was brought up with difficulty, as the cæcum was closely attached to the pelvic wall. It was found sharply bent upon itself, with thin adhesions attaching its proximal third to the intestine. Upon opening it after removal, it was found to have a normal mucosa at either end, but contained a catarrhal secretion in the middle third. The abdomen was lightly drained; there was but slight shock, and the patient made an uneventful recovery.

CASE II.—K. B., male, aged nineteen years. Personal history negative, until June, 1903, when a short attack of intestinal obstruction occurred, accompanied with vomiting and severe pain. The condition was relieved by high enemata.

September 20, 1903, he was seized with a similar attack late in the evening, following an indigestible meal. High enemata were unavailing. A hypodermatic injection of one-quarter grain of morphine, repeated within an hour, failed to control pain. Peristalsis was constant. Vomiting occurred at frequent intervals, the patient remaining on his hands and knees in great distress. The abdomen was considerably distended, and the recti muscles were rigid. The most marked point of tenderness was two centimetres below and one centimetre to the right of the umbilicus. Lavage of stomach and laparotomy performed eighteen hours after onset. Incision through right rectus below umbilicus. About 100 cubic centimetres blood-stained serum escaped upon opening the peritoneal cavity. Two coils of ileum were found constricted; the constriction being due to a twisting of the bowel around a diverticulum, extending from a point on the ileum eighteen inches above the ileocæcal valve to the left pelvic wall. This diverticulum was also twisted upon itself to the point of obstruction, the distal end being distended and of a deep color. The diverticulum was excised between ligatures, its base at the proximal end being inverted into the intestine and closed by purse-string suture. The appendix vermiformis, which was found congested, was removed. Towels wrung out of hot salt solution were applied to the injured intestines, their normal color gradually returning. The patient reacted well, and the vomiting and pain gradually subsided. Bowels moved on the third day. Primary union. Uneventful recovery.

The literature on the subject of intestinal crises caused by Meckel's diverticulum is meagre.

Cases of intestinal obstruction similar to my second case have of late years been not infrequently observed, but instances of acute inflammatory, gangrenous, and perforative diseases of the diverticulum similar to my first case are decidedly rare.

Dr. William Perrin Nicholson, of Atlanta, Georgia, reported such a case in the *New York Medical Journal* of June 23, 1900. His case was operated upon on the third day, and, while vomiting ceased and some improvement followed the operation, the patient died eighteen hours later. Autopsy showed the diverticulum had caused no mechanical constriction, and the intestinal obstruction was due to the inflammatory process about the gangrenous diverticulum. Dr. Nicholson at this time collected reports of six cases. Two of these were reported by Dr. Richardson, of Boston, one of which was saved by operation.

Dr. C. R. Gildersleeve reported a case in the *Medical News*, Vol. lxxii, in which operation was declined, and autopsy revealed obstruction of the ileum, caused by Meckel's diverticulum, which had become twisted upon itself, and its contents were incarcerated. The diverticulum terminated in a fibrous cord, forming a complete ring through which the ileum passed.

This case, therefore, should hardly be classed as one of disease of the diverticulum, *per se*.

The fourth case in this collection was reported by Dr. J. H. Elliot in the *Boston Medical and Surgical Journal*, 1894. The patient was operated upon four days subsequent to the attack, and died upon the second day following operation. The diverticulum in this case extended from the convex part of the ileum to the umbilicus. It was obstructed and gangrenous.

The fifth case in the series is reported by Guirrard in the *Bull. et Mém. de la Soc. de Chir.*, Paris, 1898, Vol. xxiv.

The patient presented all the symptoms of appendicitis. Was seen in consultation by the operator nine hours after onset of the attack, but was not operated upon until the following day. Patient died. Autopsy revealed a Meckel's diverticulum seventy centimetres from the ileocæcal valve, the distal end of which was adherent to the mesocolon near rectum. The report does not state that the diverticulum was gangrenous, and this case may belong to the class of mechanical obstructions caused by a diverticulum rather than to disease of the diverticulum itself.

The sixth case cited in this series is reported by Dr. W. Mintz in the *Deutsche Zeitschrift für Chirurgie*, Vol. xlviii. This patient, like the others, suffered from intestinal obstruction. A diagnosis of appendicitis was made. He was treated with ice and opium, death occurring on the sixth day. Autopsy revealed a diverticulum sixteen centimetres long and eighty centimetres from ileocæcal valve. Pathological details

are not given, but it was presumably a case of obstruction due to the presence of the diverticulum rather than obstruction caused by disease of the divertienlum itself.

Searching the literature further, I find a case which should be classed with the first case I have related, reported by C. R. Darnall, M.D., United States Army, in the *New York Medical Journal*, January 12, 1901.

His patient was a United States volunteer soldier, twenty-two years of age. He was attacked June 8 with pain in the abdomen, and a feeling of weakness and exhaustion. He was admitted to the Battalion Hospital at Talle the day after his attack. He was then suffering tympany, vomiting, abdominal pain, and tenderness. He was given magnesium sulphate, which he did not retain, and morphine hypodermatically. An enema was used without effect.

Unfortunately, he was attacked on shipboard, and the conditions suitable for operation were not obtained until three days after the onset.

The abdomen was opened in the right iliac region; the cæcum and appendix were found to be normal. The wound was closed. Patient died three days after the operation. Autopsy. Abdomen very much distended. Abdominal wound in good condition. General peritonitis existed. A Meckel's diverticulum was found six inches long, three feet above the ileocæcal valve. The distal extremity was attached to the abdominal wall at the umbilicus. The proximal end bore a large gangrenous patch, near the centre of which was a perforation two centimetres in diameter.

This, then, is a case corresponding to the one which I have reported.

Dr. A. L. Wright, of Carroll, Iowa, reported before the Dubuque Medical Society, June 22, 1899, a case of recurring abdominal crises in a male aged twenty-seven years, upon whom he reported, in the interval following, an unusually severe attack of abdominal pain, prostration, vomiting, and constitutional disturbance. His physicians made a diagnosis of recurring appendicitis, and the operation was performed with the expectation of removing the appendix. Instead, a divertienlum was found three inches in length. The distal end of the divertienlum was thickened and rough, bearing evidences of inflammatory attacks. The caliber at the proximal end was much narrowed. The wall of the ileum at its junction with the divertienlum was extremely thin, but had not perforated. For this reason a portion of the ileum, three inches long, was resected and an anastomosis accompanied by means of a Murphy button. Patient recovered.

In a thesis read before the Faculte de Médécine de Paris by Henri Blanc in 1899, on "Contribution à la Pathologie du Diverticule de Meckel," are collected from various clinics

of Europe, and a few from the literature of this country, records of forty-eight cases of abdominal diseases due to Meckel's diverticulum. Eighteen of these were cases of intestinal obstruction due either to volvulus or invagination of the ileum. Of the remaining thirty, twelve were cases of acute inflammatory and perforative disease of the diverticulum, causing in most of the cases general peritonitis and death. The balance of the series was made up of instances of cysts, tumors, and herniæ, all caused by Meckel's diverticulum. Of the twelve inflammatory and perforative cases, eight were fatal. Three were saved by operation, and of one the result is not stated.

Meckel's diverticulum is usually found springing from the ileum, two or three feet from the ileocecal valve. It is estimated by anatomists that it occurs in about 2 per cent. of the human species. Rarely it remains patulous and open at the umbilicus, but it generally has a blind extremity and is of varying length. It may be continued as a cord to the umbilicus, or may become attached to the lateral pelvic wall. It is a remnant of the vitellin duct of the embryo which has failed to become obliterated.

From its rarity in the human subject, abdominal crises due to Meckel's diverticulum can never be of frequent occurrence; but it is one of the conditions which the surgeon must bear in mind when making a diagnosis, and when searching in the abdominal cavity for the cause of the obstruction and of the peritonitis. No class of cases demonstrate more clearly the great importance of early laparotomy, for, whether we are dealing with obstruction from a diverticulum or from a general peritonitis due to a perforation, we are dealing with an emergency, every hour the existence of which, unrelieved, adds to the gravity of the situation, and reduces steadily and surely the chances of recovery.

In the twenty-one cases of general peritonitis due to gangrene, perforation, or both, of Meckel's diverticulum, it will be seen that fifteen proved fatal. In none of these fatal cases was an operation performed *earlier than the third day.*

The three cases which have recovered in this country are

Dr. Elliot's, Dr. Wright's, and the one herein reported. The credit for the recovery of this case is due largely to Dr. E. O. Elmer, who acted with great promptness in calling counsel and preparing the family and the patient for an operation.

The abdomen was opened eighteen hours after the onset of the attack, and but little credit, comparatively, is due to the operator, for the result would have been successful in any hands.

Time is of the utmost importance in determining the result of operation in these cases. It is in this class of cases, rather than that of acute and complete obstruction, that dangerous delays are likely to occur, for the inflammatory lesion, even with its fatal outpour into the abdominal cavity, may not produce obstruction; and in the absence of the more alarming obstructive symptoms the physician is more likely to allow himself to wait, in the hope that the trouble may be relieved without operation.